

What is claimed is:

1. A compound that binds to a BCL6 lateral groove and prevents binding of a corepressor to the lateral groove.

5 2. The compound of claim 1, wherein the compound is an organic molecule less than 3000 molecular weight.

3. The compound of claim 1, wherein the compound is an aptamer.

10 4. The compound of claim 1, wherein the compound is a peptide or mimetic comprising the sequence xxxxzxxxxxsx(w/h)xzpx, where x is any amino acid or mimetic analog and z is a non-polar amino acid or mimetic analog.

5. The compound of claim 1, wherein the compound comprises SEQ ID NO:10.

15 6. The peptide or mimetic of claim 1, comprising SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3.

7. The peptide or mimetic of claim 6, comprising SEQ ID NO:1.

20 8. The peptide or mimetic of claim 6, comprising SEQ ID NO:2.

9. The peptide or mimetic of claim 6, comprising SEQ ID NO:3.

25 10. The peptide or mimetic of claim 4, having 84 or less amino acid or analog residues.

11. The peptide or mimetic of claim 4, having 21 or less amino acid or analog residues.

12. The peptide or mimetic of claim 4, having 17 amino acid or analog residues.

30 13. The peptide or mimetic of claim 4, wherein at least one amino acid or analog residues is mimetic analog residues.

35 14. The peptide or mimetic of claim 4, wherein all of the amino acid or analog residues are mimetic analog residues.

15. The peptide or mimetic of claim 13, wherein the mimetic analog residue is a retro-inverso or D-isomer amino acid.

5 16. The peptide or mimetic of claim 14, wherein the mimetic analog residues are retro-inverso or D-isomer amino acids.

17. The peptide or mimetic of claim 1, further comprising at least one functional group.

10 18. The peptide or mimetic of claim 17, wherein the functional group is a moiety that facilitates purification.

19. The peptide or mimetic of claim 18, wherein the moiety that facilitates purification is a (His)<sub>6</sub> moiety.

15 20. The peptide or mimetic of claim 17, wherein the functional group is a moiety that facilitates entry of the peptide or mimetic into a cell.

20 21. The peptide or mimetic of claim 20, wherein the moiety that facilitates entry of the peptide or mimetic into a cell is a protein transduction domain from the HIV pTAT protein.

22. The peptide or mimetic of claim 17, wherein the functional group is a moiety that facilitates detection of the peptide or mimetic.

25 23. The peptide or mimetic of claim 22, wherein the moiety that facilitates detection of the peptide or mimetic is a fluorescent moiety, a radioactive moiety, or an antigen.

24. The peptide or mimetic of claim 4, wherein the moiety that facilitates detection of the peptide or mimetic is a hemagglutinin epitope tag.

30 35 25. The peptide or mimetic of claim 4, wherein the peptide or mimetic further comprises a (His)<sub>6</sub> moiety, a protein transduction domain from the HIV pTAT protein, and a hemagglutinin epitope tag.

35 26. The compound of claim 1, in a pharmaceutically acceptable excipient.

27. A method of blocking corepressor binding to a BCL6 lateral groove, the method comprising contacting the BCL6 with the compound of claim 1.

5 28. The method of claim 27, wherein the BCL6 is in a mammalian cell.

29. The method of claim 28, wherein the mammalian cell is a cancer cell that requires BCL6 repression.

10 30. The method of claim 28, wherein the cancer cell is in a mammal.

31. The method of claim 30, wherein the mammal is a human.

32. The method of claim 29, wherein the cancer cell is a lymphoma cell.

15 33. The method of claim 28, wherein the cancer cell is a breast cancer cell.

34. The method of claim 27, wherein the compound comprises the amino acid sequence of SEQ ID NO:10.

20 35. The method of claim 27, wherein the compound comprises the amino acid sequence of SEQ ID NO:1.

36. The method of claim 27, wherein the compound comprises the amino acid sequence 25 of SEQ ID NO:2.

37. The method of claim 27, wherein the compound comprises the amino acid sequence of SEQ ID NO:3.

30 38. A method of inhibiting BCL6 repression in a mammalian cell, the method comprising treating the cell with the compound of claim 1.

39. The method of claim 38, wherein the cell is a cancer cell.

35 40. The method of claim 39, wherein the cancer cell is a lymphoma cell.

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41. The method of claim 39, wherein the cancer cell is a breast cancer cell.

42. The method of claim 38, wherein the cell is in a mammal.

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43. The method of claim 42, wherein the mammal is a human.

44. The method of claim 38, wherein the compound comprises the amino acid sequence of SEQ ID NO:10.

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45. The method of claim 38, wherein the compound comprises the amino acid sequence of SEQ ID NO:1.

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46. The method of claim 36, wherein the compound comprises the amino acid sequence of SEQ ID NO:2.

47. The method of claim 36, wherein the compound comprises the amino acid sequence of SEQ ID NO:3.

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48. A method of treating a mammal with cancer, wherein the cancer requires BCL6 repression, the method comprising administering the compound of claim 1 to the mammal.

49. The method of claim 48, wherein the mammal is a human.

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50. The method of claim 48, wherein the cancer is a lymphoma.

51. The method of claim 48, wherein the cancer is a breast cancer.

52. The method of claim 48, wherein the compound is a peptide or mimetic.

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53. The method of claim 52, wherein the peptide or mimetic comprises SEQ ID NO:10.

54. The method of claim 52, wherein the peptide or mimetic comprises the sequence of SEQ ID NO:1.

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55. The method of claim 52, wherein the peptide or mimetic comprises the sequence of SEQ ID NO:2.

56. The method of claim 52, wherein the peptide or mimetic comprises the sequence of  
5 SEQ ID NO:3.

57. A polypeptide comprising SEQ ID NO:12.

58. The polypeptide of claim 57, which is a fusion protein.

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59. The polypeptide of claim 57, consisting of SEQ ID NO:12.

60. A polynucleotide encoding the polypeptide of claim 57.

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61. A vector comprising the polynucleotide of claim 60, capable of expressing the polypeptide.

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62. A method of determining whether a test compound inhibits corepressor binding to BCL6, the method comprising determining whether the test compound binds to a BCL6 lateral groove, wherein a compound that binds to a BCL6 lateral groove inhibits corepressor binding to BCL6.

63. The method of claim 62, wherein the test compound is an organic compound less than 1000 molecular weight.

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64. The method of claim 62, wherein the test compound is an organic compound less than 3000 molecular weight.

65. The method of claim 62, wherein the compound is an aptamer.

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66. The method of claim 62, wherein the compound is a peptide or peptide mimetic.

67. The method of claim 66, wherein the peptide or mimetic comprises SEQ ID NO:10.

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68. The method of claim 66, wherein the peptide or mimetic comprises SEQ ID NO:1.

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69. The method of claim 66, wherein the peptide or mimetic comprises SEQ ID NO:2.

70. The method of claim 66, wherein the peptide or mimetic comprises SEQ ID NO:3.

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71. The method of claim 62, wherein binding of the compound to the lateral groove is determined using polypeptide comprising SEQ ID NO:12.